Diptera Tachinidae Dexiini of New Caledonia. The genus *Senostoma* Macquart

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ABSTRACT

The New Caledonian and surrounding Melanesian faunas of Dexiini are briefly discussed and the genera and species known from New Caledonia are enumerated. Two New Caledonian species of *Senostoma* Macquart (otherwise confined to Australia) are characterized and discussed in relation to the Australian fauna. The close affinity between the New Caledonian species and the Australian *rubricarinatum*-complex is discussed and distinguishing characters are provided. A key to New Caledonian species of *Senostoma* is presented. *Senostoma tenuipes* (Bigot, 1885) is redescribed and *S. flavipes* (known from 3 localities south of 22° N) is described as new.

RÉSUMÉ

Les faunes de Dexiini de Nouvelle-Calédonie et de Mélanésie sont brièvement discutées. Deux espèces du genre *Senostoma* Macquart, genre connu par ailleurs exclusivement d'Australie, sont décrites et comparées aux forme australiennes. Leurs affinité avec les formes australiennes du complexe *rubricarinatum* sont discutées, et leurs caractères diagnostiques sont mis en évidence dans une clé. *Senostoma tenuipes* (Bigot, 1885) est redécrite et *S. flavipes* est décrite comme nouvelle de trois localités situées au sud du 22e parallèle.

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The Dexiini is a virtually cosmopolitan tribe of Tachinidae which parasitizes larvae of holometabolous insects associated with soil or living/decomposing wood. Hosts are nearly always Coleoptera, although a few other orders (particularly certain hepialid lepidopterans) are occasionally attacked if the larval niche is suitable.

Dexiini are very variable in form, although adults of many species have a conspicuous facial carina and are slender-bodied with elongate legs. The commonest species in Australasia are most often encountered in montane areas, particularly on or near tree-trunks (notably *Eucalyptus, Angophora* and *Casuarina* in Australia). The Australian genera have been most recently treated by CROSSKEY (1973), while MESNIL (1969) described the only two non-carinate species known from Melanesia.

Australasia has an unusually rich and diverse fauna of Dexiini, although in the main confined to mainland Australia and Tasmania. The tribe is noticeably depauperate in New Guinea and the Pacific Islands (Melanesia and Polynesia) and is completely lacking from New Zealand, where larval Coleoptera are attacked by the dominant tachinine tribe, the Occisorini. The Australian genera are endemic, except for *Prosena* Le Peletier & Serville which is moderately represented in Papua - New Guinea and Indonesia, occurs eastwards as far as Tonga and is widespread (although represented by relatively few species) in the Oriental and Palaearctic Regions.

New Caledonia has the greatest diversity of Dexiini in Melanesia/Polynesia, Fiji being the only other island where more than one genus is represented. There are at least 2 species of *Prosena* as well as a single species described in *Billaea* Robineau-Desvoidy (widely distributed outside Australia) by MESNIL (1969). However, the latter form and a closely related species from Fiji (described in the same paper) are best placed in a new genus near *Trichostylum* Macquart from Australia (BARRACLOUGH, in preparation). *Senostoma* Macquart is the third genus occurring in New Caledonia, known only from *Rhynchiodexia tenuipes* Bigot, 1885 and a closely related new species described below.

MATERIAL AND METHODS

Description are based on specimens from the following institutions :

BMNH — British Museum (Natural History), London.

MNHN — Muséum national d'Histoire naturelle, Paris.

ORSTOM — Institut français de Recherche scientifique pour le Développement en Coopération, Centre de Nouméa.

Unless otherwise stated, all specimens are deposited in MNHN.

Exact holotype data is cited. Semi-colons separate data presented on different labels and a slash (/) denotes the termination of a line of print on an individual label. Holotype measurements are given in parentheses after the range for each species.

Wing length was measured from the humeral crossvein to the wing-tip, and body length from the anterior extremity of the fascial carina to the abdominal apex.

Morphological terminology and abbreviations concur mostly with CROSSKEY (1973) and CANTRELL (1988). Exceptions are *mv* (medioventral seta) and A.s.3 (third antennal segment). Bilaterally symmetrical structures are described in the singular.

CHARACTERIZATION OF NEW CALEDONIAN *SENOSTOMA*

Senostoma Macquart, 1847, is almost entirely restricted to Australia, where it is likely to be revised to more than 35 species and commonly occurs in all states and on most of the coastal and Bass Strait islands. *Rhynchiodexia* Bigot, 1885 (New Caledonia) and three other nominal

genera (Australia) have been proposed for carinate Dexiini with reduced palpi, two sternopleural setae and a short, stiff mentum, but none of these names can be upheld when sufficient material is examined and *Senostoma* Macquart is the valid name which applies to this complex of forms (synonymy established by CROSSKEY, 1973). The New Caledonian species have an extraordinarily slender, apically tapering mentum which immediately distinguishes them from Australian species in which the mentum is generally broad and robust for much of its length (cf. figs 1-2). BIGOT also noted the short, slender proboscis in his original description, although this has not been referred to in the literature since. However, both species otherwise have a suite of character states which clearly fit *Senostoma* and CROSSKEY (1973) was certainly correct in synonymizing *Rhynchiodexia* with *Senostoma*.

The nominal genus *Rhynchiodexia* has been frequently misidentified and confused with other generic concepts. MALLOCH (1930) confused it with *Macropodexia* Townsend (a monotypic Australian genus), but admitted that he had doubts about his identification. Numerous species of the New World genus *Ptilodexia* Brauer & Bergenstamm have been erroneously described in *Rhynchiodexia*.

AFFINITIES WITH AUSTRALIAN SPECIES

Both *Senostoma tenuipes* (Bigot) and *S. flavipes* n. sp. are restricted to New Caledonia, but have affinity with Australian species having short aristal plumosity (shorter than width of A.s.3 in profile), the lunula entirely bare, a differentiated pteropleural seta and a complete abdominal T1+2 excavation. The *rubricarinatum*-complex (valid nominal species listed below) is the most closely related group of such species, and is widespread in Australia, particularly in the eastern states. Hosts are melolonthine Scarabaeidae, notably *Sericesthis* Dejean, 1835, a genus which includes serious tree-defoliating pest species.

***rubricarinatum*-complex** : *rubricarinatum* (Macquart, 1846) ; *brevipalpe* (Macquart, 1846) ; *variegatum* Macquart, 1847 ; *appendiculatum* (Macquart, 1851) ; *setigerum* (Malloch, 1930) ; *commune* (Malloch, 1930) ; *unipunctum* (Malloch, 1930). [Note that *commune* is probably a junior synonym of *appendiculatum*, but synonymy is not established in the present work.]

This complex (key characters listed below) exhibits a perplexing array of external morphological character states, as well as variation in the form of the terminalia. There also appear to be a number of thoracic pleural hairing colours morphs (entirely pale, entirely dark, mostly pale but mesopleuron dark haired), although intergrading forms exist and sexual dimorphism is likely. Morphometric analysis and possibly even allozyme electrophoresis will be needed to resolve meaningful specific limits. Nevertheless the distinctive New Caledonian species (character states in parentheses) are easily recognized :

1. Mentum broad and robust, not tapering much apically (fig. 2).
   [Mentum very slender, apical half markedly tapered (figs 1 & 3)]
2. Parafacial completely bare.
3. Pteropleural seta (and setulae) surrounded by dark hairing.
   [Pteropleural seta and associated dark setulae surrounded by pale hairing.]
4. Hypopleuron with single dark setal row in male.
   [Hypopleuron with conspicuously clustered row of pale hairing in male.]
5. Mesonotum with 2 pairs of inconspicuous, narrow longitudinal vittae of comparable width.
6. Wing membrane surrounding *r-m* dark infuscated.
7. Abdominal dorsum with uniform, entirely dark ground colour.

The presence of *Senostoma* in New Caledonia is a zoogeographic surprise. The genus is a predominantly southern group and is mostly restricted to Australia south of 25° S. I have not seen any material from Queensland's Cape York Peninsula or the Northern Territory and *Senostoma* is certainly absent from New Guinea. The New Caledonian species are very closely related, probably indicative of a recent derivation from the *rubricarinatum*-complex of eastern Australia.

TAXONOMY

Genus *SENOSTOMA Macquart*, 1847

Senostoma MACQUART, 1847 : 96 (80). Type species : *Senostoma variegata* MACQUART, 1847, by monotypy ; type locality Tasmania, Australia.

Rhynchiodexia BIGOT, 1885 : xi. Type species : *Rhynchiodexia tenuipes* BIGOT, 1885, by monotypy ; type locality New Caledonia.

Rhynchodexia, *Rhyncodexia*. Variant spellings of authors, not BIGOT.

Key to species of New Caledonian *Senostoma*

1. Tibiae and femora dark brown. Thoracic spiracles dark brown. Wing with bend of *M* lacking an appendix. Abdominal T3 without median discal setae in male ..... ***tenuipes*** (Bigot)
– Tibiae irregularly dark and pale brown, femora pale brown (always partly yellow-brown in apical one – to two – thirds). Bend of *M* with short, stubby appendix. Abdominal T3 usually with median discal setae in male (fig. 4) ..... ***flavipes*** n. sp.

Senostoma flavipes n. sp.

(fig. 1, 3 & 4-6)

Etymology : *L. flavus* = yellow ; *pes* = leg. Refers to the generally pale legs.

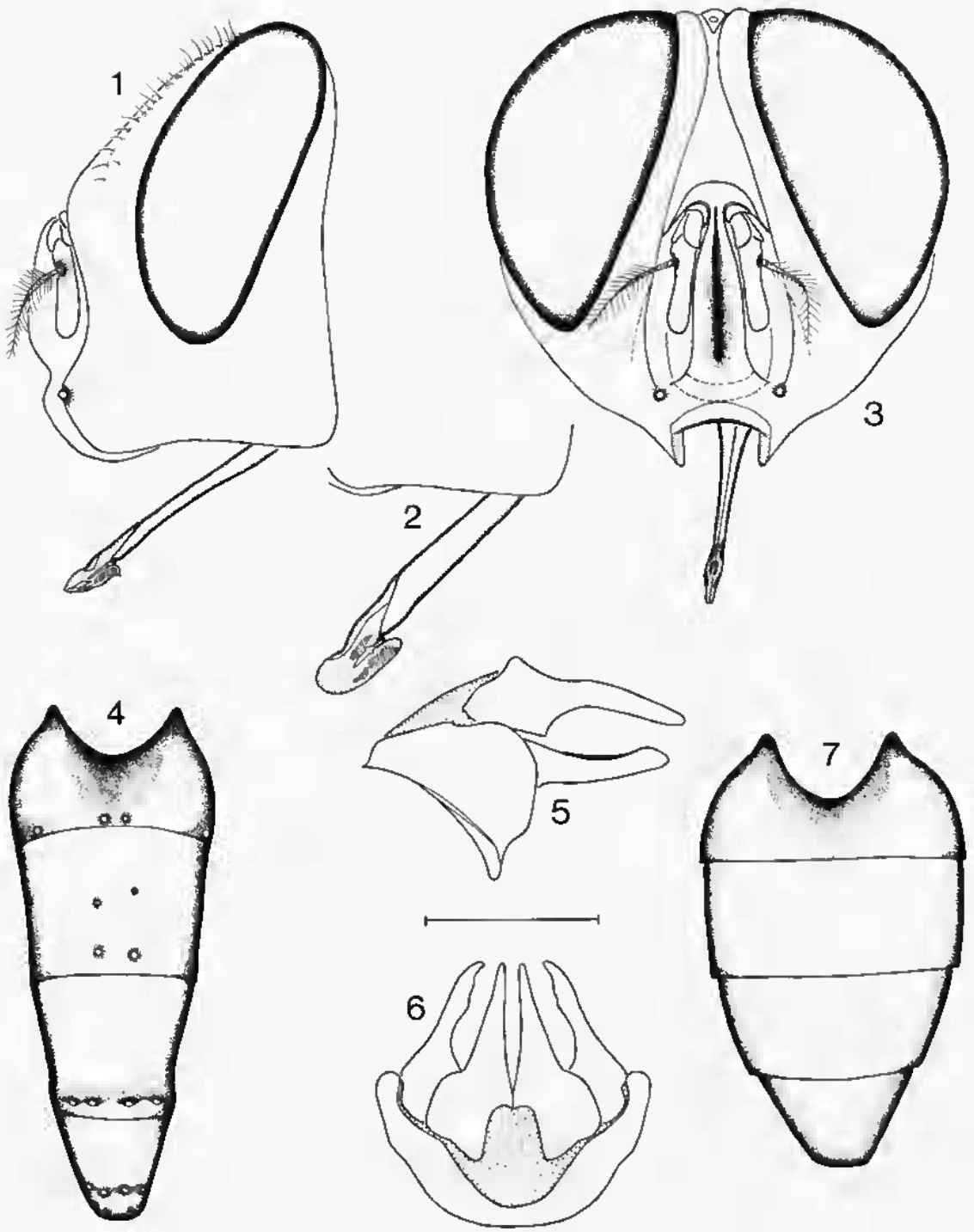
Type material : holotype data : ' Forêt de Yaté [Assumed at or near Yaté] / 2.9.71 / P. Cochereau ' ; ' NOUVELLE CALEDONIE ' ; 'HOLOTYPE ♂ / Senostoma / flavipes / Barraclough ' [MNHN]. This specimen was designated as holotype because of the complete and visible mentum and palpi. The mentum is broken apically or mostly obscured in the paratypes. The holotype is in reasonable condition although the mesonotum and abdomen are mostly greasy and some of the tarsal segments of most legs (except fore) are missing. The male paratypes have complete tarsi and/or undisturbed mesonotal/abdominal pollinosity.

Paratypes : one ♂ : Forêt de la Thi, 22°14′ S, 166°32′ E, 2.IX.1971 (P. COCHEREAU). One ♂ : Rivière Bleue, maquis sur crête, 22°05′ S, 166° 40′ E, piège de Malaise, 5-20.I.1987 (L. BONNET DE LARBOGNE, J. CHAZEAU, A. & S. TILLIER).

Description : male. Body length 11,5-13,7 [13,7] mm ; wing length 8,8-9,9 [9,9] mm.

Colour/Pollinosity. First and second antennal segments yellow-brown to orange, A.s.3 similarly coloured basally and on inner surface, but otherwise dark ; mentum dark brown with yellow-brown palpi ; remainder of head mostly dark brown to black with silver pollinosity, but lower parafacial and anterior two-thirds of gena brick-red to yellow-brown and lunula, facial/epistomal regions pale yellow-brown. Thorax (including scutellum) dark brown to black with silver pollinosity, except pale yellow to brown pollinose on mesonotum ; pleural hairing white to yellow ; spiracles entirely pale. Mesonotal vittae very narrow and indistinct, lateral vitta about 2,0 × width of medial vitta presuturally. Tarsi entirely dark brown to black ; tibiae irregularly pale and dark brown ; femora mostly pale brown/brick-red, at least partly yellow-brown on much of apical one – to two – thirds. Lower calypter densely silver to yellow pollinose. Wing mostly hyaline, brown infuscated along costal margins and around most veins. Abdomen entirely dark, pollinosity mostly silver but distinctly brown mid-dorsally and along anterior/posterior margins of T3 and T4.

Head. Parafrontals moderately to closely approximated, separated by 0,2-0,5 × width of ocellar triangle at narrowest point (fig. 3) ; inner half of parafrontal with inconspicuous, short pale hairing (fig. 1). Lunula and parafacial completely bare. Aristal plumosity 0,8-1,0 × width of A.s.3 in profile (fig. 1). Facial carina



FIGS 1, 3, 4, 5, 6. — *Senostoma flavipes* n. sp., male. 1 : head, profile, showing mentum, aristal and parafrontal hairing ; 3 : head, frontal view, showing mentum, facial carina and frons ; 4 : abdomen, dorsal outline, showing setal insertions ; 5-6 : terminalia, hairing omitted ; 5 : profile ; 6 : dorsal view. Scale = 0,5 mm, figs 5-6.
FIG. 2. — *Senostoma rubricarinatum*-complex, mentum in profile.
FIG. 7. — *Senostoma tenuipes* (Bigot), female abdomen, dorsal outline.

broad and robust, broadest near ventral end (0,6-0,8 × lunula width), moderately to deeply grooved medially in upper three-quarters (fig. 3). Mentum unusually slender, tapering noticeably in apical half, width in profile less than that of A.s.3, length 0,6-0,7 × head height (figs. 1 & 3). Palp broad, 2,0-3,0 × width of aristal base and 0,6-0,7 × length of A.s.3.

Thorax. Propleuron bare. Pteropleuron with strongly differentiated seta, 2,0 × height of surrounding dark setulae and pale hairing. Hypopleuron with strongly clustered row of long, yellow hairing. 0+2 *ia*, 3+3 *dc*, 1+1 *acr*.

Legs. Fore claws reduced, 0,5 × length of apical tarsal segment. Mid tibia without *mv*. Mid and hind legs strikingly long and slender, length of entire hind leg about 2,5 × body length ; fore tarsus 0,7× length of hind tarsus. Only hind tibia noticeably sinuous, broader in apical half.

Wing. Lower calypter bare or with very few inconspicuous, short hairs along extreme outer margin. Costal spine absent. Second costal sector completely bare ventrally. M_1 well short of wing-tip, distance subequal to length of *r-m*. Bend of *M* almost right-angular with a conspicuous but short, stubby appendix. Vein *r-m* with slightly swollen appearance, part of surrounding membane appearing brown with transmitted light.

Abdomen. Unusually slender in dorsal outline, just longer than head and thorax, tapering markedly apically, width at apex 0,2-0,3 × width at base (fig. 4). T1+2 excavate to (or very near) posterior margin. Median marginal setae present on T1+2 and T3 ; marginal setal rows present on T4 and T5, T5 with irregular row of setulae just posterior to setae ; median discal setae usually weakly developed on T3, lacking on T4 and T5 (fig. 4).

Postabdomen. T6 virtually bare. Epandrium and St5 with short, dark hairing similar to surrounding vestiture on T5. Distiphallus with sclerotized basal lamella, entirely restricted to dorsal region. Terminalia as in figs 5 & 6.

Female. Unknown.

Discussion : although *flavipes* is distinguished from *tenuipes* primarily on colouring and not structural characters, I feel certain that these two forms are distinct. The noticeably pale leg colouring (quite different from the dark ground colour in *tenuipes*) is highly significant, distinctive leg colour being the type of character which separates closely related Australian species.

I have carefully compared the male terminalia of *flavipes* and *tenuipes* and have found them to be very similar in shape and form, both with unusually slender surstyli which are apically incurved in dorsal view (figs 5 & 6). Longer series of both species may elucidate some subtle distinctions. It should however be noted that the form of the male terminalia in Dexiini is not necessarily a good specific character. A revision of Australia's endemic genera (in preparation) has shown that there may be very marked intraspecific variation in the shape of the cerci and surstyli and related but distinct species can have generally very similar terminalia.

Senostoma tenuipes (Bigot)

(fig. 7)

Rhynchiodexia tenuipes Bigot, 1885 : xi. (holotype female in BMNH ; type locality New Caledonia) [Examincd].
Rhynchiodexia tenuipes : TOWNSEND, 1932 : 37 ; TOWNSEND, 1938 : 373.
Senostoma tenuipes : CROSSKEY, 1973 : 116.

Type material : holotype data : ' Type ' [Circular printed label with red perimeter ; handwritten above and below the print respectively are ' Rhynchiodexia ' and ' tenuipes, / Bigot. ']; ' New Caledonia, / Oceania / Ex coll. Bigot. / Pres. by G. H. Verrall, Oct. 1904. / 1904-274. ' [Provenance pencilled in by E. AUSTEN (see CROSSKEY, 1971 : 300)]. The holotype is in fair condition, althought the head is crumpled on the left hand side, the right wing-tip is missing, as are the left hind tarsus and the right mid and hind legs.

Other material examined : one ♂ : Rivière Bleue, maquis sur crête, 22°06' S, 166°40' E, 310 m, piège de Malaise, 5-20.I.1987 (L. BONNET DE LARBOGNE, J. CHAZEAU, A. & S. TILLIER). One ♂ : Rivière Bleue, Parc. 5, 450 m, piège de Malaise, 13-28.X.1986 (L. BONNET DE LARBOGNE & J. CHAZEAU).

Description : male. Body length 10,8-14,3 mm ; wing length 7,9-10,2 mm. Very similar to *flavipes*, differing in characters cited in species key and as follows : lower calypter sometimes brown pollinose ; parafrontals closely approximated,

separated by 0,2-0,3 × width of ocellar triangle at narrowest point.

Female. Body length [11,0] mm ; wing length [8,6] mm. Very similar to *flavipes*, differing in characters cited in species key and as follows (secondary sexual features (except those of abdomen) excluded) :

Colour/Pollinosity. Parafrontal, parafacial and epistomal region yellow pollinose.

Head. Facial carina without medial groove.

Thorax. Basal scutellar marginal setae lacking.

Abdomen. Shape and chaetotaxy typical of *Senostoma* females : obovate in dorsal outline, 0,7 × length of head and thorax (fig. 7) ; T1 + 2 without median marginal setae, T3 and T4 with median and lateral marginal setae, T5 with complete marginal setal row, discal setae absent on all tergites.

Discussion : this species has very similar secondary sexual female characters to Australian *Senostoma*. Thus, in addition to the abdominal features cited above there are 2 pairs of proclinate orbital setae and the mesonotal vittae are relatively broad and distinct.

The basal scutellar marginal setae are lacking in the holotype, but this is assumed to be teratological. The basals are present in all known Australasian Dexiini, but I have seen Australian *Senostoma* species in which they are rather weakly developed.

The male terminalia are virtually indistinguishable from those of *flavipes* (figs 5 & 6) and have consequently not been figured.

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I should like to thank Mr Adrian Pont (BMNH) for the loan of the holotype of *Rhynchiodexia tenuipes* Bigot and Jean Chazeau (ORSTOM) for sending me material of *Senostoma flavipes*. Special thanks are also due to Loïc Matile for locating material of New Caledonian *Senostoma* in the collection of MNHN. I am generally indebted to Prof. D. C. Sandeman for constant support and encouragement and the provision of a zoom stereo microscope and miscellaneous equipment.

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